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ABSTRACT

The growing body of gerontological research examining the correlates of life satisfaction indicates that physical health is its strongest correlate. Within this framework, the relationship between satisfaction and health among 29 institutionalized subjects was investigated through a longitudinal study. Unlike previous studies, objective measures of health were supplemented with subjective estimates. Unexpectedly, strong independence between satisfaction and objective estimates of health was found. The well-documented correlation between subjective estimates of health and life satisfaction suggests a larger attitudinal orientation toward life rather than an actual interaction between biology and psychology. There is a need for future studies supplementing subjective estimates with objective measures of satisfaction and health, as well as future studies employing a longitudinal design. (Author)

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SATISFACTION AND HEALTH OVER 60:
A Longitudinal Study

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Several studies have found positive relations between life satisfaction and self-reported indices of physical health in aged samples (see Larson, 1978). Larson notes that none of these studies have used a longitudinal design. The present study uses a longitudinal design in an attempt to test hypotheses about the causal direction of influence between these two variables. Also, the studies have relied on self-report measures of health and have not included indices of health and physical functioning which are independent of self-report. The present study includes both self-report and non self-report indices of health and physical functioning.

METHODS

Subjects. -- All subjects were in residence in a private nursing facility. Of the 150 individuals living in the home, 100 were over 60 years of age, and of these 40 were considered by the staff to be capable of participation in this study. Of these, 29 agreed to participate, 15 females and 14 males. Twenty-two of the 29 subjects were retested three months later, 12 females and 10 males. Three subjects had died, two refused to participate, and two had left the facility. The remaining subjects had a mean age of 73 years, ranging from 60 to 90, a mean educational level of 11 years, and a mean length of institutionalization of 42 months.

Procedure. -- Subjects were administered the Life Satisfaction Index A either individually or in groups (Neugarten, Havighurst, & Tobin, 1961). Self-reported physical health was obtained using a five point scale, asking subjects to rate their health relative to other individuals of the same age. The responses on the scale range from very much better to very much worse. High values indicate positive estimates. Subjects were also asked to rate the number of friends they had in the nursing home on a five point scale

ranging from very many more friends than others to very many less friends than others. Measures of bowel continence and bladder continence, and hearing and visual acuity, were obtained from nursing home records. The continence measures were scored on a four point scale and the acuity measures were scored on a three point scale. In all instances, higher scores indicate better functioning. A composite autonomy index was formed based on a seven point scale measuring ambulation, a three point scale measuring ability to dress oneself, a four point scale on ability to feed oneself, and a three point scale on ability to bathe oneself. Positive scores indicate greater autonomy and self-care. This information was derived from nursing home records.

RESULTS AND DISCUSSION

Table 1 presents both the means and the standard deviations for the principle variables obtained on two consecutive testings. None of the means

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Insert Table 1 about here.

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were significantly different using t-tests. Table 1 indicates high test retest reliability and stability for mean scores.

Tables 2 and 3 present the cross-sectional correlational matrices for Time 1 and Time 2. In juxtaposing the tables, observe that the correlation

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Insert Tables 2 and 3 about here.

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matrices appear to be quite similar. In fact, there are no significant differences in the correlations between the same variables obtained at different times. Thus the correlations reported in Tables 2 and 3 may be considered to be identical except for sampling variation.

Tables 2 and 3 both indicate patterns of negative correlations between age and measures of physical functioning derived from nursing home records. Age, however, is positively correlated with self-reported physical health. The correlations among the class of physical health variables tend to be positive. Bowel continence and bladder continence are significantly correlated, ranging from r = 0.61 at Time 1 to r = 0.91 at Time 2. The correlations among the five physical health variables are not invariably strong. For example, the correlation between hearing and vision is significant at Time 2 (r = 0.59) yet somewhat lower at Time 1 (r = 0.26). In further examining the biological variables, notice that the correlations between the class of physical health variables and the autonomy index are positive. Bowel continence significantly correlates with autonomy for the second testing (r = 0.58). The correlations between hearing and autonomy as well as between vision and autonomy are low, yet positive in magnitude.

In comparing self-report and non self-report measures, notice that the non self-report measures have a low order and perhaps even an insignificantly negative correlation with both self-reported physical health and the LSIA. Similarly, the correlations between the autonomy index and these two self-report measures, for both testings, range from r = -0.08 to r = +0.04. In sum, Tables 2 and 3 point to a cross-sectional independence between self-report and non self-report measures.

Attending to the self-report measures, notice that self-reported number of friends, self-reported physical health, and the LSIA correlate positively with each other. Specifically, the correlation between self-reported number of friends and self-reported physical health is significant for Time 1 (r =

0.42) and somewhat lower for Time 2 (r = .29). The correlation between self-reported number of friends and the LSIA approaches significance for Time 1 (r = 0.37) and is significant for Time 2 (r = 0.43). Yet most importantly, the correlation between self-reported physical health and the LSIA is significant well beyond the 0.01 level for both Time 1 (r = 0.75) and Time 2 (r = 0.61).

Generally, Tables 2 and 3 show 1) low order, mostly positive correlations among the health measures derived from nursing home records, 2) significant positive correlations among the self-report measures, and 3) insignificant, close to zero correlations between these two classes of measures.

Table 4 presents the longitudinal correlational matrix for the principle variables at Time 1 (vertical column) and Time 2 (horizontal column). One method of analyzing the correlations reported in Table 4 is to use a cross-lagged panel analysis (Kenny, 1975). In this method of analysis relations over time between two variables are compared by contrasting the correlation between Variable 1 at Time 1 and Variable 2 at Time 2 with the correlation between Variable 2 at Time 1 and Variable 1 at Time 2. If there is a significant difference between these "lagged" correlations, it is possible to infer support for a hypothesis that a causal relationship exists between these two variables. If the correlation between Variable 1 at Time 1 and Variable 2 at Time 2 is greater than the correlation between Variable 2 at Time 1 and Variable 1 at Time 2, then it is possible to infer that it is more nearly correct to say that Variable 1 exerts a causal influence on Variable 2, rather than the converse.

For example, Figure 1 presents the cross-lagged correlations between self-reported number of friends and autonomy. The correlation between self-reported number of friends at Time 1 and autonomy at Time 2 is $r = 0.40$,

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Insert Figure 1 about here.

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whereas the correlation between autonomy at Time 1 and self-reported number of friends at Time 2 is $r = 0.05$. The difference between these two correlations is 0.45, $p < .05$. The significant difference between the cross-lagged correlations indicates that it is self-reported number of friends which causes, or at least influences, autonomy over time, and not autonomy which causes or influences self-reported number of friends.

Similarly, Figure 2 presents the cross-lagged correlations between self-reported number of friends at Time 1 and the LSIA. The correlation between self-reported number of friends at Time 1 and the LSIA at Time 2

Insert Figure 2 about here.

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is $r = 0.49$, whereas the correlation between the LSIA at Time 1 and self-reported number of friends at Time 2 is $r = 0.30$. The correlational difference is 0.19, and it is insignificant at the 0.05 level. Even though causality cannot be definitely concluded, self-reported number of friends at Time 1 predicts the LSIA at Time 2 ($r = 0.49$) slightly better than the LSIA at Time 1 predicts self-reported number of friends at Time 2 ($r = 0.30$). If causality does in fact exist in this case, again it is self-reported number of friends which influences the LSIA and not the LSIA which influences self-reported number of friends.

Table 4 indicates that the cross-lagged correlations between the class of physical health measures derived from nursing home records and the autonomy index are positive. Bowel continence and bladder continence are the most strongly related to autonomy, and yet the differences between the cross-lagged correlations for the whole class of variables range from values approaching significance to zero-order magnitudes.

Insert Table 4 about here.

For example, the correlations between bowel continence at Time 1 and autonomy at Time 2 is $r = 0.64$, whereas the correlation between autonomy at Time 1 and bowel continence at Time 2 is $r = 0.34$. The correlational difference is 0.30, and it approaches significance, indicating that bowel continence at Time 1 predicts autonomy at Time 2 slightly better than autonomy at Time 1 predicts bowel continence at Time 2. In contrast, the cross-lagged correlations between hearing and autonomy range from $r = 0.12$ to $r = 0.22$, and the correlational difference is 0.10, indicating no suggestion of a causal relationship.

In comparing the physical health measures and the self-report measures, notice that the cross-lagged correlations between the class of physical health measures and both self-reported physical health and the LSIA are insignificant, slightly negative, and approaching zero. Similarly, notice that the cross-lagged correlations between the autonomy index and these two psychological variables range from $r = -0.06$ to $r = 0.15$. In sum, Table 4 points to a longitudinal independence between the physical health and the self-report measures, just as Tables 2 and 3 point to a cross-sectional one.

Table 4 also indicates that the correlation between self-reported physical health at Time 1 and the LSIA at Time 2 is r = 0.73, whereas the correlation between the LSIA at Time 1 and self-reported physical health at Time 2 is r = 0.69. Both cross-lagged correlations are significant well beyond the 0.01 level. Even so, the insignificance of the correlational difference indicates that the LSIA predicts self-reported physical health just as accurately as self-reported physical health predicts the LSIA. In other words, there is no evidence that subjective estimates of physical health and life satisfaction are causally related, despite the fact that they correlated at an extremely high level. Rather they appear to covary.

SUMMARY AND CONCLUSIONS

Despite the relatively small sample and the short time span for retesting, significant results emerged. The longitudinal and cross-sectional independence of the LSIA and measures of physical health and functioning not derived from self-report suggests, contrary to previous discussions, that there is little relationship between health and life satisfaction among the aged. The previous reported relationships may be attributable to method variance in that both the LSIA and measures of health were based on self-reports, and both variables may be related to a more fundamental attitudinal variable such as optimistic outlook.

The clear evidence of a causal relationship between friendship and both autonomy and the LSIA requires further investigation in view of the fact that friendship as assessed in the present study is a self-report measure. It would be interesting to know if this self-report measure relates to other indices of friendship, and whether such other indices would exhibit comparable causal relationships.

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Table 1. Table of Means and Correlations for Principle Variables Obtained on Two Consecutive Testings

Variable	Mean - Time 1	Standard Deviation	Mean - Time 2	Standard Deviation	r
Age	73.14	10.42	73.39	10.42	1.00
Bowel	2.75	0.55	2.64	0.79	0.75
Bladder	2.68	0.72	2.77	0.61	0.81
Hearing	1.91	0.29	1.86	0.35	0.80
Vision	1.82	0.39	1.77	0.53	0.93
Autonomy	10.41	3.58	10.45	3.63	0.93
Self-Reported Number of Friends	3.23	1.19	2.95	1.29	0.69
Self-Reported Physical Health	3.73	1.62	4.14	1.04	0.74
LSIA	22.14	7.83	20.18	7.58	0.83

Table 2. Cross-sectional Correlational Matrix for Time 1.

	Age	Bowel	Bladder	Hearing	Vision	Autonomy	Self-Reported Number of Friends	Self-Reported Physical Health	LSIA
Age	1.00	-0.43*	-0.17	-0.43*	-0.34	-0.11	0.16	0.40*	0.26
Bowel	-0.43*	1.00	0.61**	0.13	0.20	0.52**	0.10	-0.20	-0.29
Bladder	-0.17	0.61**	1.00	-0.14	-0.21	0.26	0.20	-0.17	-0.38
Hearing	-0.43*	0.13	-0.14	1.00	0.26	0.13	0.33	-0.08	0.05
Vision	-0.34	0.20	-0.21	0.26	1.00	-0.01	-0.31	-0.32	-0.08
Autonomy	-0.11	0.52**	0.26	0.13	-0.01	1.00	0.33	0.04	0.04
Self-Reported Number of Friends	0.16	0.10	0.20	0.33	-0.31	0.33	1.00	0.42*	0.37
Self-Reported Physical Health	0.40*	-0.20	-0.17	-0.00	-0.32	0.04	0.42*	1.00	0.75**
LSIA	0.26	-0.29	-0.38	0.05	-0.08	0.04	0.37	0.75**	1.00

* Significant at the 0.05 level ($r \geq 0.40$)

** Significant at the 0.01 level ($r \geq 0.52$)

Table 3. Cross-sectional Correlational Matrix for Time 2

	Age	Bowel	Bladder	Hearing	Vision	Autonomy	Self-Reported Number of Friends	Self-Reported Physical Health	LSIA
Age	1.00	-0.38	-0.30	-0.41*	-0.40	-0.17	0.33	0.22	0.20
Bowel	-0.38	1.00	0.91**	-0.02	0.02	0.52**	-0.11	-0.11	-0.07
Bladder	-0.30	0.91**	1.00	-0.15	-0.17	0.58**	-0.13	-0.25	-0.13
Hearing	-0.41*	-0.02	-0.15	1.00	0.59**	0.20	0.20	-0.08	0.03
Vision	-0.40*	0.02	-0.17	0.59**	1.00	0.11	-0.16	0.06	-0.13
Autonomy	-0.17	0.52**	0.58**	0.20	0.11	1.00	0.07	-0.08	-0.06
Self-Reported Number of Friends	0.33	-0.11	-0.13	0.20	-0.16	0.07	1.00	0.29	0.43*
Self-Reported Physical Health	0.22	-0.11	-0.25	-0.08	0.06	-0.08	0.29	1.00	0.65**
LSIA	0.20	-0.07	-0.13	0.03	-0.13	-0.06	0.43*	0.65**	1.00

* Significant at the 0.05 level ($r \geq 0.40$)

** Significant at the 0.01 level ($r \geq 0.52$)

Table 4. Longitudinal Correlational Matrix

	Age	Bowel	Bladder	Hearing	Vision	Autonomy	Self-Reported Number of Friends	Self-Reported Physical Health	LSIA
Age	1.00	-0.38	-0.30	-0.41*	-0.40*	-0.17	0.33	0.22	0.10
Bowel	-0.43*	0.75**	0.80**	0.04	0.27	0.64**	-0.29	-0.10	-0.17
Bladder	-0.17	0.71**	0.81**	-0.18	-0.20	0.37	0.09	-0.32	-0.11
Hearing	-0.43*	0.06	-0.12	0.80**	0.47*	0.22	0.24	0.04	0.16
Vision	-0.34	-0.07	-0.18	0.50*	0.93*	0.06	-0.20	-0.05	-0.24
Autonomy	-0.11	0.34	0.46*	0.12	0.00	0.93**	-0.05	-0.16	-0.07
Self-Reported Number of Friends	0.16	0.19	0.20	0.30	-0.22	0.40*	0.69*	0.36	0.49*
Self-Reported Physical Health	0.40*	-0.11	-0.16	-0.21	-0.26	0.05	0.28	0.74**	0.73**
LSIA	0.26	-0.14	-0.21	0.04	-0.04	0.01	0.30	0.69**	0.83**

* Significant at the 0.05 level ($r \geq 0.40$)

** Significant at the 0.01 level ($r \geq 0.52$)

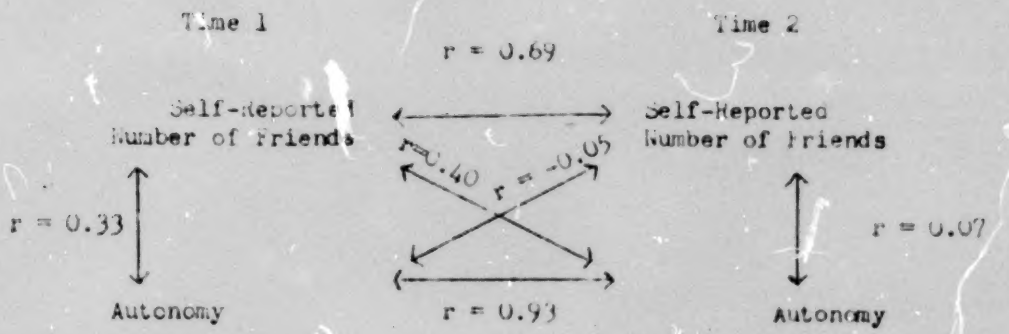

Figure 1. A cross-lagged Panel Analysis for Self-Reported Number of Friends and Autonomy.

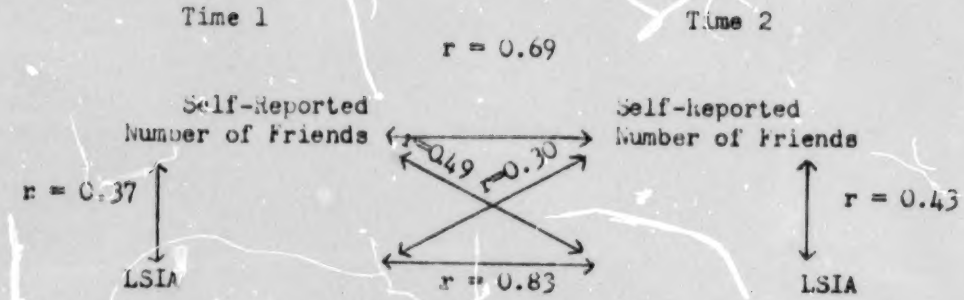

Figure 2. A Cross-Lagged Panel Analysis for Self-Reported Number of Friends and the LSIA.